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A REVIEW OF ONE THOUSAND OPERATIONS FOR GALLSTONE DISEASE, WITH SPECIAL REFERENCE TO THE MORTALITY.[1]

BY WILLIAM J. MAYO, M.D.,
AND
CHARLES H. MAYO, M.D.,
SURGEONS TO ST. MARY'S HOSPITAL, ROCHESTER, MINNESOTA.

FROM June 24, 1891, to December 1, 1904, we had made 1000 operations upon the gall-bladder and bile passages, with 50 deaths (5 per cent.). About 95 per cent. of the cases were operated upon in St. Mary's Hospital and under nearly identical conditions.

In a rapidly growing field of this character there have necessarily been many changes in technique. For such improvements we are much indebted to the literature of the subject. We have benefited from the work of Murphy, Ochsner, Elliot, Richardson, Park, Bevan, McBurney, Halsted, and a host of others, and especially to the late W. E. B. Davis. To Robson, Moynihan, Kehr and Reidel, we wish also to acknowledge a debt of gratitude.

A study of mortality must be based upon some definite plan, and, so far as the writers know, there is no settled method upon which a correct estimate of the death rate in any series of operations can be compiled. What are we to understand by a mortality of a certain percentage? Some operators say that if a patient dies as a result of the operation itself, it should be counted; whereas, if the operation failed and the patient continued along for a time, then died from the disease or of a complication, it should not be charged to the operation. The defect in this method is that it allows of a large degree of personal equation, and the same statistics may be made to look very well or very badly, as the critic is prejudiced for or against the operation. One very prominent operator declares that any individual dying within fourteen days from any cause should be attributed to the operation, and after that time it was a question to be settled by the judgment of the surgeon. In this series of cases we have taken the view of the layman, that if the patient goes into the hospital alive and comes out dead, the death resulted from (or in spite of) the operation. It is to be understood, therefore, that in estimating the death rate we have charged as a death from operation every patient who died in the hospital, without regard to cause of death or the time which elapsed between the operation and the fatal issue. It includes patients dying as long as three months after operation and from intercurrent disease or accidental cause, such as apoplexy, pneumonia, heart disease, chronic nephritis, etc. A percentage of the deaths could be fairly excluded, but as the object is to show the relative curability of gallstone disease rather than good statistics, we have concluded that the above method is at least unprejudiced. It undoubtedly has a tendency to exaggerate the dangers of operation, particularly in common-duct disease, where long-continued infections of the bile passages have resulted in blood changes, causing death at a late period. But it also illustrates the dangers of delay and the tendency to produce complications which operation may be unable to relieve.

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[1] Read at the meeting of the Southern Surgical and Gynecological Association, by Charles H. Mayo, M.D., 1904.

In the 1000 operations there were 50 deaths in the hospital, or an average death rate of 5 per cent. In the benign series there were 960 cases with 4.27 per cent. For malignant disease, 9 deaths in 40 operations gives a mortality slightly in excess of 22 per cent.

Where the disease was limited to the gall-bladder, including all non-perforating infections, the mortality was 2.44 per cent.; 573 cholecystostomies, mortality 2.46 per cent.; 186 cholecystectomies, mortality 4.3 per cent. This does not include 101 cholecystostomies and 44 cholecystectomies performed as part of a common-duct operation. We have followed the rule of counting as one operation all the different procedures done through a single incision. The major or most serious is classified; the others are considered secondary and appear only in the record of the patient.

Of the common-duct operations there were 137 benign, with 16 deaths, 11.7 per cent. This gives a heavy mortality, but, as already pointed out, it is really a death rate of operation and disease, and means that 7 per cent. failed to recover from the direct results of the operation, that is, died within a few days; while 4 per cent. recovered from the operation, but did not regain sufficient strength to leave the hospital. Many cases operated were in desperate condition from prolonged icterus, anæmia, etc. No cases were refused operation if they so elected after a fair statement of the facts. Operations for malignant disease are discouraging; 40 operations, with 9 deaths in the hospital, and of those that recovered comparatively few received sufficient palliation to repay the immediate risk, suffering, and expense. Two cases, however, can be considered favorable as to cure; both were instances of early carcinoma of the gall-bladder. In a few patients a thick-walled and functionally useless gall-bladder was removed, and examination showed malignant involvement, and in the 2 cases referred to no return has as yet taken place after more than two years. We have recently had 2 cases of a like character, but as yet too early to be considered as to the probability of cure.

Next to malignancy and acute perforative infections of the gall-bladder and pancreas, the most serious thing that can happen in gallstone disease is involvement of the common duct of the liver.

Contrast a mortality of 2.44 per cent. in 820 cases where the disease was confined to the gall-bladder with 11.7 per cent. in 137 cases where the common duct is involved.

It would exceed the limits of this paper to go into the details as to various operations performed, and we will confine ourselves to a short discussion of the mortality in the benign group of cases and a comparison of results after the three most common operative procedures, cholecystostomy, cholecystectomy, and choledocotomy.

It can be fairly stated that the average mortality of operations for diseases confined to the gall-bladder is not greater than for appendicitis in patients of the same age and condition of health. Gallstone disease is most frequent in people of advanced years—often obese and not infrequently the victim of some degenerative lesion of vital organs. One cannot directly contrast such cases with disease of the appendix, which is by far more common in younger and more robust subjects.

CHOLECYSTOSTOMY. Of these there were 573 (exclusive of 101 in connection with common-duct operations), with 14 deaths, a mortality of 2.46 per cent. This includes most of the acute infections with localized peritonitis. At least one-third of these deaths were from purely accidental causes that had to do with the general condition of the patient. The mortality of cholecystostomy in simple gallstone disease in otherwise normal individuals was less than 1 per cent. In 186 cholecystectomies (exclusive of 36 common-duct cases) the mortality was 4.30 per cent., or nearly twice that of cholecystostomies. It may be urged that this latter operation was elected in the more severe cases, and to a certain extent this is true, but not wholly so, as the more dangerous acute infections were nearly always drained by cholecystostomy. Inasmuch as in not a single instance did stones reform in the gall-bladder when left, cholecystostomy must be considered the safe operation, cholecystectomy being reserved for certain cases in which cholecystostomy may be expected to furnish, in a considerable proportion of cases, a partial or complete failure. Other things being equal, all cystic gall-bladders should be removed, and especially when a stone is impacted in the cystic duct, as not infrequently a stricture may follow removal, interfering with the escape into the common duct of the normal secretions of the mucous membrane, thus giving rise to colics or external mucous fistula. As a rule, gall-bladders which are found to contain bile at the time of operation may be drained, as if bile can get through the cystic duct mucous secretion can escape. If the cystic duct should be considerably injured during removal of the calculus, introducing doubt as to the future permeability, the gall-bladder should, of course, be removed. Again, gall-bladders which are suspiciously thick and hard should be excised, as in this way early malignancy may occasionally be cured, as shown in the 2 cases referred to above.

In most cases of chronic cholecystitis without stones the gall-bladder should be removed. The presence of gallstones gives rise to irritation, and their removal, with subsequent drainage by cholecystostomy, may be expected to leave a harmless organ, but an infection which is able to continue without the aid of foreign bodies calls for a more radical operation.

We must not be too ready to diagnosticate cholecystitis without stones on operation, or we may cover a mistake in diagnosis, and send home an unrelieved patient with an unnecessary operation. Before a diagnosis of non-calculous cholecystitis is permissible, the duodenum, stomach, pancreas, appendix, and right kidney must be examined, and if the theory is correct the gall-bladder should be found thickened, of light color, with the lymphatic glands along the cystic and common ducts markedly enlarged. It should contain tarry bile and the mucous membrane should be not only thickened, but covered with little, fibrinous specks.

In patients who have gallstones and who have suffered from attacks of jaundice and other symptoms of infection of the common and liver ducts, but without stones in the ducts, cholecystostomy is the operation of choice, as it furnishes bile drainage. Cholecystectomy, if performed in this latter group, should not be accomplished by ligating the cystic duct, as it may be vital to secure bile drainage, and the duct must be left open, or, if necessary, split down to the common duct for this purpose. If the cystic duct is patulous, cholecystostomy furnishes this drainage easily and safely, and in case of future common-duct stone, the gall-bladder is a reliable guide to the common duct and greatly facilitates a secondary procedure.

It must be borne in mind that stones may form in the common duct secondary to an infection from gallstones in the gall-bladder, and especially so if a stone has passed through the common duct or has been removed from it. It has been urged that the gall-bladder in gallstone disease is obsolete and should be removed in every case. In our experience there has been a slightly increased hazard and without compensating increase in permanence of cure or shortening of convalescence in the average case. We find indication for removal of the gall-bladder in about 2 cases out of 5, but consider cholecystostomy the operation of choice, and only perform cholecystectomy for definite pathological conditions, such as we have called attention to.

The most common cause of death where the gall-bladder alone was involved has been a descending infection of the common and hepatic ducts. Cholangitis, as a result of gallstone disease, at once introduces a most serious complication. As long as the stones were confined to the gall-bladder they were, so to speak, but a side issue to the possibilities of trouble engendered by lodgement in the deep ducts, for here an infection is lighted up which may extend to the smallest bile ducts, and over which, as compared with gall-bladder disease, we have but little control. A process is instituted which may result in stone formation, even in the most minute bile ducts, and future trouble after apparent cure may be the result. The death of 16 patients in 137 operations for gallstones in the common-duct series and 4 out of 9 malignant cases at once demonstrates the serious character of common-duct surgery. Not that the operation itself is particularly difficult nor prolonged, but we have two serious elements introduced, jaundice and infection, and the mortality, both immediate and remote, of choledochotomy depends almost entirely upon these factors. About one-third of all patients with common-duct stones have little or no jaundice at the time of operation and very little infection. However, at the time the stones passed into the common duct there will usually be found in the history that there had been both jaundice and infection, and during the acute stage operation would have been fraught with greater danger. During the quiescent period operation is very safe in such patients, and the mortality in our experience not more than 2 per cent.

Unfortunately, the majority of common-duct patients have either never had an intermission or have passed beyond it, and operation is no longer an election as to time, but a necessity, and, no matter how desperate, must be done to save life. In some cases the infection is the more prominent feature, giving typical ague symptoms. Sudden chills, with high temperature, followed by rapid decline, and a little temporary increase in jaundice and attended with moderate pain, and often nausea, are pathognomonic. In others there is little infection, but such a degree of bile stasis in the ducts as to invite infection after any kind of operation. Some individuals are almost sure to die. Patients with extreme jaundice and subcutaneous hemorrhage will nearly always bleed to death from capillary oozing. If purpuric spots exist with jaundice, we keep the subjects under treatment until the blood will at least remain in the proper channels. In all cases of jaundice we use chloride of calcium, following the advice of Robson for a few days before operation, but we are uncertain as to its exact value.

Another class of cases who have in our experience all died, and about whom we are not always able to foretell the conditions previous to operation, are those patients with obstructive jaundice in whom no trace of bile is to be found in the bile passages, the common and hepatic ducts being filled with clear fluid. The liver has been put out of action. The patient, while extremely feeble, may be up and about. The jaundice is extreme, but is not necessarily accompanied by leaky bloodvessels and subcutaneous hemorrhages. We have had 4 of these cases, and all died within four days. In 2 cases a little bile appeared in the drainage at the end of twenty-four hours, but in none did liver action become re-established.

In a number of instances the same condition was met with at an earlier stage, the bile ducts being filled with thick, flocculent bile of a dark-greenish color, very much like that which occurs in the gall-bladder during the acute stage of cystic-duct obstruction and before the pigments have become absorbed. In about half of this group the liver will begin to functionate and the patient recover. In reviewing the deaths in common-duct operations, one is impressed by the influence of jaundice, not only in vitiating the general health of the patient, as shown in the tendency to capillary bleeding, but even more important in the invitation which it extends to infection. Combined jaundice and infection is the cause of most of the late deaths from general debility and exhaustion which occur after a primarily successful operation. While we have had no cases in which stones have reformed in the gall-bladder after cholecystostomy, we have had 2 cases in which stones formed in the common duct, after the removal of a single large stone from the gall-bladder in 1 case and in the other many stones from both gall-bladder and common duct, showing that stone formation may take place independently of the gall- bladder, but only when there have been primary stones in this viscus.

We have seen a number of cases of liver-duct stones, but there has always been a blocking common-duct stone from the gall-bladder at the papilla behind which the intrahepatic calculi had formed, the favorable condition of partial obstruction and mild infection furnishing the proper environment. In 2 cases we have had to operate a second time upon common-duct stones which had for their nucleus hepatic-duct stones which had drifted down into the common duct subsequent to the choledochotomy. In the 1000 operations, 14.6 per cent. involved the common duct.